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Reviewed for Addressee
Corres. Control RFP

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RF-46522 (Rev. 3/93)

Department of Energy

ROCKY FLATS OFFICE
P.O. BOX 928
GOLDEN, COLORADO 80402-0928

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APR 20 1993

93-DOE-04749

Mr. Martin Hestmark
U. S. Environmental Protection Agency, Region VIII
ATTN: Rocky Flats Project Manager, 8HWM-RI
999 18th Street, Suite 500, 8WM-C
Denver, Colorado 80202-2405

Mr. Gary Baughman
Hazardous Waste Facilities Unit Leader
Colorado Department of Health
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

EG&G ROCKY FLATS PLANT
CORRESPONDENCE CONTROL
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Gentlemen:

Enclosed for review and approval is Appendix E, Rev. 0, Draft B - Quality Assurance Addendum (QAA) to the IM/IRA Solar Ponds Decision Document. The QAA addresses the quality requirements for retrofitting Building 910 to house the evaporation treatment system components, and inspect/test existing equipment to be reused for the evaporation project; and for installation and acceptance testing of portable flash evaporators and associated holding tanks and piping to treat excess liquids contained in the 207-B SEPS and water collected in the ITS.

Because approval of the QAA is essential in meeting IAG schedules, it is requested that the reviews be expedited as appropriate. A verbal notification of any major concerns would be useful. Review comments are requested by May 3, 1993.

To aid in maintaining a clearly documented record of these reviews/approvals, it is requested that all comments be recorded on the attached document review forms.

If you have any questions or require additional information, please contact Scott Surovchak at 966-3551.

Sincerely,

James K. Hartman
Assistant Manager for Transition
and Environmental Restoration

Enclosure

ADMIN RECORD

A-0004-001364

APR 20 1993

cc w/Enclosure:
H. Belencan, EM-453

cc w/o Enclosure:
A. Rampertaap, EM-453
J. Ciocco, EM-453
R. Schassburger, ERD, RFO
E. Lee, EG&G
T. Schmidt, EG&G

Category NSR

DRAFT

Approved By:

_____ / /
Work Package Manager Date

_____ / /
Department Manager Date

_____ / /
Environmental Quality Support Manager Date

Effective Date: _____

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1.0 PURPOSE

The purpose of the Quality Assurance Addendum (QAA) is to identify quality assurance (QA) requirements, and specific measures for implementing these requirements, that are applicable to the actions described in the Final Interim Measure/Interim Remedial Action Decision Document for the Solar Evaporation Ponds, Operable Unit No. 4 (DOE, April 1992). This QAA is intended to supplement the "Rocky Flats Plant Site-Wide Quality Assurance Project Plan for CERCLA Remedial Investigation/Feasibility Studies and RCRA Facility Investigations/Corrective Measures Studies Activities" (referred to as the RFP Site-Wide QAPjP, or simply QAPjP). As a supplement to the QAPjP, this QAA establishes the specific measures and QA controls applicable to the actions described in the IM/IRA Decision Document. The purpose of the IM/IRA is to facilitate implementation of the SEPs Resource Conservation and Recovery Act (RCRA)/Colorado Hazardous Waste Act (CHWA) partial closure actions. The proposed actions are intended to stabilize wastes in the SEPs, so that subsequent characterization and remediation can be completed for Operable Unit No. 4.

2.0 SCOPE

This QAA addresses the Building 910 evaporator process. The specific actions of the selected SEP IM/IRA, to which this QAA apply, include:

- Retrofitting Building 910 to house the evaporation treatment system components, and inspect/test existing equipment to be reused for the evaporation project; and
- Installation and acceptance testing of portable flash evaporators and associated holding tanks and piping to treat excess liquids contained in the 207-B SEPs and water collected in the ITS.

3.0 BASIS FOR RESPONSE ACTIVITY

The SEPs are CHWA/RCRA interim status regulated units that are currently undergoing closure activities in accordance with the CHWA and implementing regulations in 6 CCR 1007-3, Part 265. The RFP Federal Facilities Compliance Agreement (also referred to as the Interagency Agreement or IAG) establishes the administrative process for CHWA/RCRA interim status closures at the RFP in Attachment 2, Section I.B.11. Paragraph 15 of the IAG states that the purpose of the IAG is to identify IMs and IRAs, which are appropriate at the [RFP] Site prior to the implementation of final remedial actions. Attachment 2, Section I.B.10 of the IAG requires the Department of Energy (DOE) to address all expedited response actions as IM/IRAs. The SEP IM/IRA *Decision Document* was prepared in accordance with Section I.B.10 of the IAG. The actions proposed to be completed under this IM/IRA are also necessary to meet the intent of commitments made in Attachment B of the RFP Agreement In Principle (AIP).

4.0 *BASIS OF QA REQUIREMENTS*

The QAPjP was prepared to identify the QA requirements and methods applicable to the RFP Environmental Restoration (ER) Program activities, as identified in the Attachment 2 of the IAG. Section IV.A of the IAG specifies the minimum quality elements that the QAPjP must include and references EPA QAMS/005/80, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, for guidance in preparing the QAPjP. Since the SEP IM/IRA falls under the scope of the IAG, this QAA also addresses the quality elements of QAMS/005/80.

The QAPjP is a DOE QA Plan, and as such, it must address DOE QA requirements in addition to those specified by the IAG. Therefore, the QAPjP format is based on DOE guidance, as opposed to QAMS/005/80. Figure 2-1 of the QAPjP illustrates those sections of the QAPjP that address the quality elements of QAMS/005/80. Since this QAA follows the format of the QAPjP, the quality elements of the QAMS/005/80 are addressed in the same sections here.

Subsequent to the preparation of the QAPjP the DOE Office of Environmental Restoration and Waste Management (ER&WM) prepared a QA Requirements Description (QARD) document that sets forth the QA requirements and guidance for all QAPs in support of all DOE environmental management, which includes the ER Program at the RFP. The ER&WM QARD requires DOE organizations and contractors to develop, implement, and maintain a QA Program based on DOE Order 5700.6C. The DOE Rocky Flats Office (RFO) has prepared Rocky Flats Instruction (RFI 5700.6) that invokes DOE Order 5700.6C for operations at RFP. The quality requirements of the EG&G Rocky Flats QA Manual (RF QAM), which incorporate the quality requirements of 5700.6C, RFI 5700.6, NQA-1, and guidance form other QA source documents, are potentially applicable to all EG&G Rocky Flats functional organizations, and must be selectively applied using a graded approach.

The basis of the quality requirements of this QAA consist of the QAPjP (which incorporates the applicable requirements of QAMS/005/80, DOE Order 5400.1, and NQA-1), the ER&WM QARD document, RFI 5700.6, and the Rocky Flats QA Manual. Since both the ER&WM QARD document and RFI 5700.6 invoke 5700.6C, which had not been approved at the time the QAPjP was prepared, Table 1 identifies those sections of this QAA that address the 10 criteria of 5700.6C. The format of this QAA allows the 22 Quality Requirements (QRs) of the RF QAM to be addressed. QR 21 has been combined with audits in Section 6.18 and the SEP IM/IRA management has determined that QR 22 does not apply to this activity.

5.0 PROJECT DESCRIPTION

Excess liquids need to be removed from the 207-B ponds to allow pond sludge to be removed and solidified. Natural evaporation of pond liquids will take several years to dewater the ponds. Water collected by the ITS is currently pumped into Pond 207-B North. Therefore, the addition of collected ITS water must cease and an alternative means of storing and treating collected water and removing excess pond liquids is required to allow removal of sludge from the SEPs.

TABLE 1. DOE 5700.6C QA Criteria Compliance Matrix

DOE Order 5700.6C QA Criteria	Section of QAA That Addresses QA Criteria
Criterion 1 - QA Program	Section 6.1 - Organization and Responsibilities Section 6.2 - Quality Assurance Program
Criterion 2 - Personnel Training & Qualification	Section 6.2 - Quality Assurance Program
Criterion 3 - Quality Improvement	Section 3.0 - Design Control and Control of Analytical Data Section 6.10 - Inspections Section 6.15 - Control of Nonconformances Section 6.16 - Corrective Action Section 6.18 - Quality Verification Section 6.20 - Quality Improvement
Criterion 4 - Documents and Records	Section 6.6 - Document Control Section 6.17 - QA Records
Criterion 5 - Work Processes	Section 6.3 - Design Control and Control of Analytical Data Section 6.5 - Plans, Procedures, Instructions, and Drawings Section 6.8 - Identification and Control of Items, Samples, and Data Section 6.12 - Measuring and Test Equipment Section 6.13 - Handling, Storage, & Shipping
Criterion 6 - Design	Section 6.3 - Design Control and Control of Analytical Data
Criterion 7 - Procurement	Section 6.4 - Procurement Document Control Section 6.7 - Control of Purchased Items and Services
Criterion 8 - Inspection & Acceptance Testing	Section 6.10 - Inspections Section 6.11 - Test Control Section 6.14 - Inspection, Test, and Operations Status
Criterion 9 - Management Assessment	Section 6.2 - Quality Assurance Program Section 6.16 - Corrective Action
Criterion 10 - Independent Assessment	Section 6.10 - Inspection Section 6.18 - Quality Verifications

The selected remedy consists of diverting water collected in the ITS into temporary surge tanks and pumping pond liquids and ITS water through three portable flash evaporators located within Building 910 or through Building 374 evaporators. Distillate from the evaporators will be sampled and analyzed to determine if it can be used as steam plant make-up feed water and/or by the plan cooling towers. Water used within the plant process is referred to as "raw water." The criteria for "raw water" are based on the safe drinking water standards promulgated in 40 CFR 141 Subpart B, except for turbidity and microbiological standards. Specific acceptance criteria for using distillate as raw water are established in the Building 910 Product Qualification Test Plan. If distillate meets raw water requirements, it will be pumped into the Raw Water Header for use by the steam plant or in the plant cooling towers. The concentrate from the evaporators will be collected in storage tanks, where it will be sampled to verify characteristics, and then transferred to Building 374 where it will be further treated, as necessary, and cemented into blocks.

6.0 QUALITY REQUIREMENTS

6.1 Organization and Responsibilities

The DOE RFO is responsible for the overall coordination of the SEP IM/IRA, including interfacing with regulators, approval of the Final Safety Analysis Report for the Building 910 evaporator start-up and operation, review and approval of the process qualification test plan, and review and approval of the readiness assessment.

The EG&G Rocky Flats Environmental Restoration Management (ERM) organization is responsible for management and coordination of the resources dedicated to the IM/IRA project. The ERM Solar Ponds Project Division is responsible for preparing the IM/IRA Decision Document and any amendments thereto, required procedures and operating orders/instructions, and implementing of the selected remedy. The ERM Environmental Quality Support Division is responsible for preparing this QAA and providing internal quality verification support (including [1] inspections and surveillance of system

acceptance and production phase sampling and testing and [2] self assessments) to assure that the quality requirements of this QAA and the QAPjP are being implemented.

The EG&G Rocky Flats Environmental and Waste Management (E&WM) organization is responsible for providing general operations support, including the staffing of the evaporators operation, for management of brine wastes and any other RCRA wastes generated during acceptance testing and process operations, and for conducting and providing training for any required RCRA inspections. E&WM personnel assigned to operate the Building 910 evaporator shall adhere to the Process Control Plan and the RFP Conduct of Operations Manual (COOP) and shall perform self-assessments to assure compliance with process control requirements. E&WM is responsible for preparing the Health and Safety Plan, the Operational Safety Assessment, and the Emergency Preparedness Plan for the SEPs, which apply to the actions of the SEP IM/IRA.

The EG&G Rocky Flats Engineering and Technology organization is responsible for providing design support and support to the Solar Ponds Project Division for developing procedures. Facilities Inspection is responsible for conducting inspections of system parts and components.

The EG&G Rocky Flats Administration and Planning organization is responsible for providing support for procurement, receipt, and delivery of the required materials and services.

EG&G Rocky Flats Construction Management is responsible for construction in accordance with completed design packages and related subcontracting. Construction Management will also coordinate all required inspections and design resolutions. Facilities Project Management will determine activities needing, and prepare, Baseline Change Proposal.

EG&G Rocky Flats Maintenance and Plant Support organization is responsible for preventive maintenance.

Plant Safety, Safeguards, and Security will provide general health and safety support to the project, including approving the SEP Health and Safety Plan, Operational Safety Analysis, and Emergency Preparedness Plan.

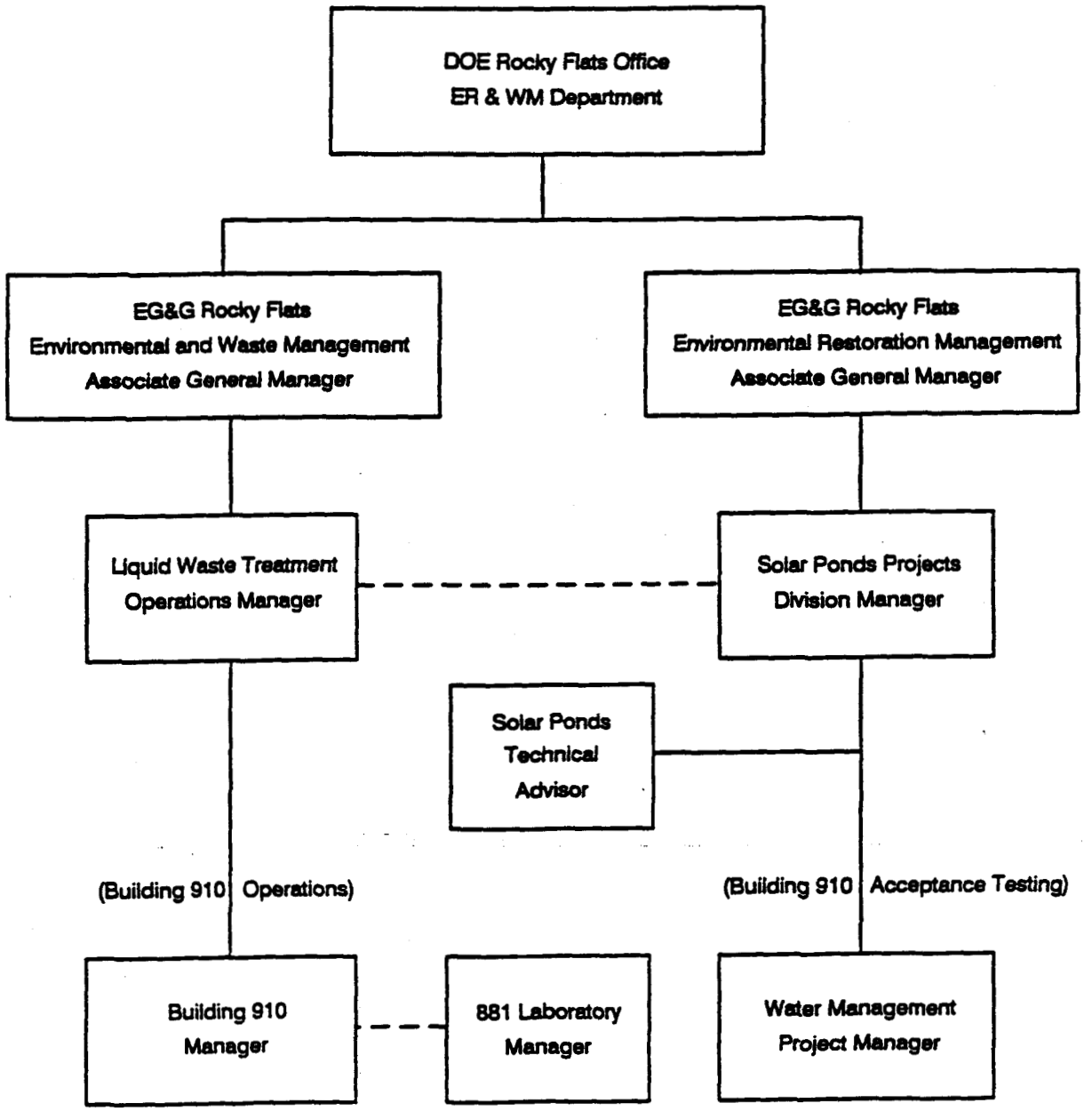
The EG&G Rocky Flats Standard, Audits, and Assurance (SAA) organization shall concur with the graded approach to the operational readiness assessment and is responsible for conducting independent audits and assessments of project activities.

The organization structure for the management of the IM/IRA is illustrated in Figure 1. The organization has been structured such that quality is the responsibility of those who have been assigned the responsibility of performing the work, and conformance to established requirements is verified by individuals and groups not directly responsible for performing the work.

6.2 Quality Assurance Program

This QAA addresses the quality requirements and methods of implementation that are applicable to the SEP IM/IRA activities, as described in the SEP IM/IRA Decision Document. The quality requirements and methods of implementation specified in the QAPjP are applicable to the SEP IM/IRA, unless specified otherwise in this QAA. This QAA identifies any additional quality requirements and methods of implementation that are applicable to the Building 910 evaporator system, including requirements and methods specified in the Waste Management Quality Assurance Program Plan and the Rocky Flats Quality Assurance Manual.

Figure 1. SEP IM/IRA Organization Chart



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6.2.1 Personnel Training and Qualification

All EG&G Rocky Flats and subcontractor personnel providing support to the design, construction/installation, testing, and operation of the Building 910 evaporator system shall receive documented training in the procedures they are working to and shall have qualification records that document they are qualified to perform their assigned tasks. Personnel training and qualification records shall be consistent with documentation specified in the Rocky Flats Training Users Manual (TUM), Section 2.0 of the Hazardous Waste Requirements Manual, Section 2.2.2 of the Low Level Waste Management Plan, or Section 2.0 of the QAPjP.

The Solar Ponds Project Division Manager shall identify any Rocky Flats Plant area-specific and/or specialized training requirements, as listed in the TUM, that are applicable to project personnel. Operations personnel are required to complete the Occupational Safety and Health Administration (OSHA) 40-hour safety training for hazardous waste site workers and RFP annual RCRA Training (see Section 1.01 of the TUM). On-the-job training for operators of the evaporator system will be provided by the evaporator manufacturer during the initial trial run of the system. Job specific training will include theory of operations, system components, principles of operations, system interrelationships, protective devices, and practical factors. Operations personnel shall be qualified as specified in Section 6.0 of the Building 910 Evaporator Process Control Plan.

Indoctrination and training for SEP project personnel shall be accomplished through utilization of RFP-approved measures, including those specified in the RFP TUM or other approved EG&G Rocky Flats personnel training procedures.

6.2.2 Management Assessment

The Solar Ponds Project Division shall utilize established measures to perform assessment of the evaporator system construction/installation, testing, and operation activities described in the SEP IM/IRA Decision Document, Building 910 Process Control Plan, Building 910 Product Water Sampling

Program, and Building 910 Product Qualification Test Plan. Assessments conducted by ERM and SEP management shall consist of internal surveillance and self-assessments conducted according to ERM procedure 3-21000-ADM-18.02, Surveillance. E&WM Assessment and Compliance personnel shall perform self-assessments of system operation during the production phase as specified in section 2.2.3 of the Waste Management Quality Assurance Program Plan. In addition to internal surveillance and self assessments, independent audits and assessments shall be conducted by the SAA organization, in accordance with SAA procedures for audits and surveillance.

6.2.3 Readiness Review

A formal, resource intensive, DOE operational readiness review for the SEP IM/IRA is not required because of the low hazard classification of the Solar Ponds Remediation Program (SPRP), of which the SEP IM/IRA is a part of. The Building 910 Final Safety Analysis Report contains technical justification for designation of the SPRP as Safety Category III and classification of the wastes as low-level waste. Therefore, the SPRP may be designated as a non-nuclear facility/operation, according to definition criteria for a nuclear facility as stated in DOE Order 5480.5, Safety of Nuclear Facilities. Therefore, an appropriate, graded approach to readiness will be utilized. Compliance with the RFP Configuration Change Control Program (CCCP) will assure readiness of start-up of the SEP IM/IRA Evaporator System.

6.3 Design Control and Control of Analytical Data

The interim remedial actions and measures described in the SEP IM/IRA Decision Document consists of the design, installation/construction, acceptance testing, and operation of a plant facility. Acceptance testing and operation of the Building 910 evaporator system require collection and analysis of pretreatment and treatment liquid samples. Therefore, controls for both design and data collection (referred to by the QAPjP as scientific investigations) are applicable to the SEP IM/IRA.

6.3.1 Design Control

To ensure an adequate control of design activities, the design process, input, and verification shall be controlled according to established RFP procedures. The CCCP controls the overall design process and includes requirements that ensure that all appropriate codes and standards are used in the design input. Section 6.1 of the RFP Conduct of Engineering Manual (COEM) specifies the requirements for the preparation, review, and approval of design projects. The level of control applicable to the design process is dependent on the safety classification and quality level of the project, which are defined by the CCCP. The design process is implemented according to the RFP Integrated Work Control Program (IWCP) Manual.

Qualification testing, design review, and/or alternative calculations (including the use of computer programs, as appropriate) are used to verify the adequacy of the design. The appropriate requirements for design verification are specified by the CCCP. Any changes to the final design resulting form the design verification are subject to review and approval by the same individuals or organizations that reviewed and approved the original design.

6.3.2 Control of Analytical Data

The QAPjP considers activities that generate analytical data upon which decisions will be based a process that requires control. Controls for analytical data include developing data quality objectives, collecting and analyzing samples according to approved procedures, establishing and implementing quality control checks, and reducing, validating, and reporting data (as necessary) in a controlled manner.

6.3.2.1 Data Quality Objectives

Data quality objectives (DQOs) quantitatively and qualitatively describe the uncertainty that decision makers are willing to accept in results derived from sampling and analysis activities that generate data.

This uncertainty is used to specify the quality of the data required to meet the objectives of the investigations. The process for developing DQOs is summarized in Appendix A of the QAPjP.

The principal decision makers and data users consist of DOE RFO Environmental Restoration Division personnel who have overall coordination responsibilities for the SEP Project, CDH and EPA personnel who have regulatory authority (as defined in the AIP and IAG) for IM/IRA activities, EG&G Rocky Flats ERM and Solar Ponds Projects Division managers responsible for supervising the project, and EG&G E&WM managers and staff responsible for operating the evaporator system and making operating decisions based on the results of the data.

Existing analytical data from the SEP liquids and ITS water are presented in the SEP IM/IRA decision document in Section 2.3. The need to treat SEP liquids and ITS water and the selected evaporator treatment are based on this existing data.

Rather than develop a conceptual model of the evaporator treatment system, the process is described in Section 3.1 of the Decision Document. A conceptual flow diagram is also included in Section 3 of the Decision Document. The evaporator treatment system basically consists of the following individual treatments:

- straining and filtering pond liquids and ITS water (identified as the feed stream)
- running the feed stream through a vapor compression (VC) unit
- running brine from the VC unit through a multiple-effect multiple-stage (MEMS) flash evaporator

This treatment process will produce (1) distillate (vapors condensed from the VC and MEMS),which meets water quality criteria for raw water and will be used in the RFP cooling system and steam plant, and (2) treatment concentrate that will be transferred to Building 374 to be processed into RFP Saltcrete.

The objective of the evaporator treatment system is to accelerate the process of reducing the volume of SEP liquids and ITS water. Specific objectives of the evaporator treatment system include (1) establishing and verifying the baseline characteristics of the feed stream, (2) adjusting process controls (e.g., chelate feed rate and control treatment steps), (3) ensuring treatment product water (i.e., distillate) meets criteria for use as raw water, and (4) verifying that treatment concentrate is acceptable for further processing in Building 374 and that it is acceptable for transport in accordance with the RFP On-Site Transportation Manual. System qualification must demonstrate that the concentration of free chelant will not exceed 1% by weight in the final waste from per DOE Nevada Test Site Waste Acceptance Criteria NVO-325.

Pretreatment and treatment data need to be collected to accept and monitor the operation of the evaporator system. The types of data needed to satisfy the specific objectives of the evaporator treatment system during the acceptance phase are identified in Table 2. The types of data needed to satisfy the specific objectives of the operation phase are identified in Table 3.

The quality of analytical data upon which decisions are based is dependent on the analytical level of the data, contaminants of concern, levels of concern, required detection limits, and critical samples. The EPA has defined 5 levels of analytical data, which are based on the accuracy of the analytical or measurement instrument and quality controls adhered to in generating the data. The analytical levels (identified as Levels I - V) are defined in Appendix A of the QAPjP. The analytical levels for the various types of data are listed in Table 2 for the acceptance phase and Table 3 for the operation phase. The type of data needed for each objective are also identified in Tables 2 and 3. The levels of concern are identified as action criteria in the IM/IRA Waste Analysis Plan for the IM/IRA (Appendix B of the SEP IM/IRA Decision Document). The detection limits for the contaminants of concern are identified in the Building 910 Product Qualification Test Plan, for acceptance phase analyses, and the Building 910 Process Control Plan and Building 910 Product Water Sampling Plan, for production phase analysis.

Table 2. Acceptance Phase DQO Process Summary

Objective	Data Type	Analytical Level	Sampling Option/Task	Analytical Method
Determine EDTA feed rate to SEP & ITS feed streams	1) Flow rate and 2) conductivity of feed stream	I	1) Continuous 2) Manual grab sample	1) Automatic flow detector 2) Field measurement
Verify pre-treatment characteristics of feed stream	Total alpha & beta, pH, and TDS	III	Grab sample downstream of duplex filter	See Table 4 for specific lab analytical methods
Verify EDTA feed rate and determine next treatment step	Conductivity	I	Continuous analysis downstream from VC and MEMS	Automatic, in-line analyzer
Determine process acceptance	Total alpha & beta, metals, organics, anions, TDS, TOC, Alkalinity, radionuclides	III, IV, and V (for rads)	Automatic composite samples upstream of Tanks D-2, D-6, D-7	See Building 910 Product Qualification Test Plan for specific lab analytical methods
Verify Concentrate Characteristics	Total alpha & beta, others TBD	IV & V	Manual grab from tanks D-9 & D-18	See Building 910 Qualification Test Plan for specific lab analytical methods

Table 3. Operation Phase DQO Process Summary

Objective	Data Type	Analytical Level	Sampling Option/Task	Analytical Method
Determine EDTA feed rate to SEP & ITS feed streams	Flow rate	I	1) Continuous from main feeder header	1) Automatic flow detector
Verify pre-treatment characteristics of feed stream	Total alpha & beta, pH, and TDS	III	Grab sample downstream of duplex filter	See Table 4 for specific lab analytical methods
Determine next treatment step	Conductivity	I	Continuous analysis downstream from VC and MEMS	Automatic, in-line analyzer
Determine product water quality	Total alpha & beta, metals, organics*, anions, TDS, TOC, alkalinity, pH, nitrate, cyanide (total) radionuclides	IV and V	Manual composite samples from product water holding tank (T-215-D)	See Building 910 Product Water Sampling Program for specific lab analytical methods
Verify concentrate characteristics	Total alpha & beta, others TBD	IV & V	Manual grab from tanks D-9 & D-18	See Building 910 Product Water Sampling Program for specific lab analytical methods

*Organics may be eliminated if they are not detected during the process qualification and acceptance testing.

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The critical samples are the composite product water samples collected to determine if the process has rendered product water that meets criteria for raw water. The sampling and analysis options used to generate data of the quality needed to meet its intended objective are identified in Tables 2 and 3 for the acceptance and operation phase testing, respectively.

The quality of data can be established quantitatively and qualitatively. Precision, accuracy, representativeness, completeness, and comparability (referred to as PARCC parameters) are used to indicate data quality. These parameters are defined and the method of calculation presented in Appendix A of the QAPjP.

Precision and accuracy are quantitative measures of data quality and are dependent on the analyte of interest, the sample matrix, analytical method, and the quality control procedures applicable to the method of analysis. Typically, precision objectives are not applicable to analytical level I and II data since these levels of data are screening levels, upon which critical decision are not based. Accuracy for level I and II analytical data is determined via instrument calibration checks. Precision and accuracy objectives for analytical level III, IV, and V data for both the acceptance and production phases of the evaporator system are based on control limits of the specified method of analysis. The methods of analysis are specified in the Building 910 Product Qualification Test Plan, for the acceptance phase analyses, and the Building 910 Process Control Plan and Building 910 Product Water Sampling Program, for the production phase analyses. If historical measures of precision and accuracy have not been established, the precision objective will be ±35% recovery, with an accuracy objective of 75-125% relative percent difference in laboratory duplicates.

Completeness is also a quantitative measure of both the sampling and analysis process. Analytical completeness is expressed as the percentage of valid or acceptable data points obtained from analysis. Sampling completeness is expressed as the percentage of planned samples for which analytical data has been obtained. The objective for completeness is 100 percent, with a minimum acceptable goal of 90% for critical samples.

Comparability and representativeness are qualitative parameters that are ensured through careful development of and adherence to sampling and analysis plans and procedures. Deviations from established sampling and analysis protocols must be documented and potential impacts to data quality addressed. The methods for documenting deviation and corrective actions are addressed in Section 6.15.

6.3.2.2 Sampling Process

Pre-treatment and treatment samples will be collected for analysis during both the acceptance and operation phases. Samples will consist of manual grab samples taken from spigots installed in process lines, automatic flow detectors and analyzers installed in process lines that sample flow continuously, and an automatic composite sampler installed in the distillate process line. Operating procedures for collecting each type of sample will be developed, reviewed, and approved as specified in Section 6.2.5 prior to initiating acceptance testing.

The Building 910 Product Qualification Test Plan and the Building 910 Product Water Sampling Program describe the acceptance and production phase sampling programs, respectively. The samples to be collected during the acceptance phase testing will be analyzed to demonstrate the operability of the evaporators in accordance with the requirements for interim treatment of SEP and ITS waters as specified in the SEP IM/IRA Decision Document. The samples collected during the production phase will be analyzed to demonstrate the Building 910 evaporator and downstream recirculation of product water meets the criteria for commercially available raw water. The type of samples to be collected, the sampling frequency, sampling locations, and sampling instructions for the acceptance phase testing are described in the Building 910 Qualification Test Plan. The Building 910 Product Water Sampling Program specifies the types of samples to be collected, sampling locations, frequencies, and sampling instructions for the production phase sampling program.

6.3.2.3 Analytical Procedures

Appendix B of the IM/IRA Decision Document contains the Waste Analysis Plan for the Portable Evaporator System for Building 910 (referred to as the WAP). The WAP has been prepared to provide the information required by 6 CCR 1007-3, Part 264.13, General Waste Analysis. The Building 910 Product Qualification Test Plan and the Building 910 Product Water Sampling Program have been prepared to provide specifications for implementing the SEP IM/IRA WAP.

The analytical parameters for pretreatment and treatment samples, methods of analysis, required detection/quantitation limits, and maximum contaminant levels (raw water criteria) for the acceptance phase tests are specified in the Building 910 Product Qualification Test Plan. The analytical parameters for pretreatment and treatment samples, methods of analysis, and required detection/quantitation limits for the production phase analytical program are specified in the Building 910 Product Water Sampling Program. The acceptance and production phase analytical parameters are based on the test specifications identified in Tables 1A, 1B, 1C and 1D of the WAP. Tables 1A, 1B, 1C, and 1D of the WAP also identify the rationale for selecting the parameters of interest.

6.3.2.4 Decontamination

RFP procedure 4-30000-FO-0001, Decontamination, will be adhered to in decontaminating equipment used in the operation of the evaporator system.

6.3.2.6 Quality Control Checks

Quality control checks for the sampling program will consist of duplicate samples, field blanks, and trip blanks collected/prepared at the rate of one of each per sampling event. Field blanks will be prepared for analysis of VOCs only. Field blanks and duplicates will be analyzed for all parameters. The required quantity of QC samples is specified in the Building 910 Product Qualification Test Plan for acceptance phase samples, and the Building 910 Product Water Sampling Program for production phase samples.

Rinsate samples are not applicable because sampling equipment is not anticipated to be needed (i.e., samples will be collected directly from the process lines). QC checks to be performed by the analytical laboratory will be consistent with those specified in the EG&G Rocky Flats General Radiochemistry and Routine Analytical Services Protocol (GRRASP). These include preparation and analysis of laboratory control samples, laboratory duplicates, matrix spikes, and blanks. All field and laboratory instruments used to generate measurement data (including the in-line automatic conductivity meter and the flow detector) will be calibrated at a frequency specified in the applicable operating or laboratory procedure.

6.3.2.7 Data Reduction, Validation, and Reporting

Analytical laboratories will verify analytical results and compile data into data packages. Data package turn-around times for off-site contract laboratories that analyze acceptance phase samples is 45 days. Turn-around times for production phase samples, to be analyzed by the RFP 881 laboratory is 30 days.

The data packages for acceptance phase testing will be submitted to the ERM data validation contractor, who will review and validate analytical results following the data validation guidelines specified in Section 3.0 of the QAPjP. Validated acceptance phase data will then be entered in the ERM RFEDS data base. The SEP IM/IRA Project Manager will use the acceptance phase data to qualify the system operation (i.e., demonstrate that product water and concentrate criteria have been met).

Production phase data packages from the RFP 881 Laboratory will be submitted to the Building 910 Operation Manager for review and decision making. The Production phase data shall be control charted and analyzed for any statistically based indications of out-of-process situations or equipment problems, such as fouling and scaling. The control charting and data analysis program shall be developed by the E&WM Statistical Application Group. Production phase data will not be validated because of the need for quicker turn-around times and the fact that the acceptance phase data were used to demonstrate compliance with treatment criteria.

During both the acceptance and production phases it will be necessary to demonstrate that the concentration of free chelant in the product concentrate (or brine as it may be referred to) will not exceed 1% by weight in the final waste form. This determination will be accomplished by a comparison and mass balance between the feed-stream volume, quantity of EDTA added, output volume of concentrate, and a titration to determine concentration of bound chelant.

Analytical data used to demonstrate acceptable operation of the Building 910 evaporator system are considered QA records. Production phase data, used to demonstrate compliance with production phase criteria are also considered QA records. Copies of acceptance phase data packages shall be maintained by the validation contractor as QA records. Copies of production phase data packages generated by the RFP 881 Laboratory shall be submitted to the Solar Ponds Projects, IM/IRA Project Manager for transmittal to the ERM Records Center as SEP IM/IRA Project QA records. QA records shall be maintained in accordance Section 17.0 of the QAA and ERM administrative procedure 3-21000-ADM-17.01.

6.3.2.8 Air Quality Control

Based on the design and system operation controls, the Building 910 evaporator system will not generate air particulate emissions. As a further precaution to prevent particulate air emissions, the concentrate tank is vented to atmosphere via a HEPA filter. Air quality will be monitored during acceptance testing to determine if an Air Pollution Emission Notice (APEN) is required.

Each of the three evaporator units will be powered by natural gas generators. The BTU rating of the generators result in APEN limitations, which allow operation of the evaporators for only 110 days per year. A three part APEN (one for each of the generators) has been prepared and submitted to the CDH. Monitoring will occur during the acceptance phase to determine if any adjustments to system operation are required in order to comply with APEN requirements.

6.4 Procurement Document Control

Procurement of materials, equipment, parts, and services that are used in or in support of the design, construction/installation, testing, or operation of the SEP IM/IRA evaporator system as defined in the SEP IM/IRA Decision Document shall be in accordance with approved procurement procedures. Preparation and issuance of procurement documents shall be done in accordance with EG&G Procurement procedure 1-46000-PROC.001.

Procurement documents that support the design process shall be implemented in accordance with the RFP COEM. Preparation of specifications for the procurement of equipment and construction contracts shall be in accordance with DES-5 of the COEM.

Subcontractors are required to provide a quality assurance program consistent with the QAPjP and this QAA or conduct their activities in accordance with applicable requirements of the ERM QA Program as defined by the QAPjP and this QAA. Procurement documents for subcontractor services shall specify the quality requirements applicable to subcontractors.

All procurement documents prepared in support of the SEP IM/IRA project are considered QA records and shall be maintained as such by the contract technical representative (i.e., the requisitioner).

6.5 Plans, Procedures, Instructions and Drawings

The Action Plan for the Building 910 Evaporator System Startup, the Building 910 Process Control Plan, the Building 910 Product Water Sampling Program, the Building 910 Product Qualification Test Plan, and the Waste Stream and Residue Identification Code Book for Building 910 shall be reviewed and approved by the Solar Ponds Projects Manager, or designee, and all affected RFP organizations prior to start-up of the evaporator system. Operating procedures for the SEP evaporation system shall be prepared, reviewed, approved, and revised in accordance with EG&G Rocky Flats PPG procedures. The Building 910 plans and operating procedures will include appropriate quantitative and qualitative

acceptance or performance criteria to verify that activities important to safety and quality have been satisfactorily accomplished.

All design drawings for the SEP IM/IRA evaporator system shall be controlled in accordance with COEM procedures. COEM 6.1.1 specifies the requirements and responsibilities required to document the design process. It ensures that design packages are prepared in accordance with the CCCP.

IWCP Type "B" and "C" Work Packages shall be developed to control all field work associated with construction/installation of the evaporator system, including construction and installation of tanks, piping, pumps, and instrumentation. All Work Packages shall be reviewed by the RFP Health and Safety organization, RFP Engineering, and ERM, prior to final approval by the SEP Operations Manager and the commencement of work. The work packages shall also be reviewed by the same organization when work is complete to ensure proper documentation of activities and objective evidence that engineering specifications were followed.

6.6 Document Control

The SEP IM/IRA Decision Document (including Appendices), the Action Plan for the Building 910 Evaporators Startup, the Building 910 Process Control Plan, the Building 910 Product Water Sampling Program, the Building 910 Product Qualification Test Plan, and all evaporator system operating procedures referenced in this QAA shall be considered Controlled Documents. Building 910 controlled documents shall be issued and revised in accordance with E&WM procedure WO-1000, Document Control Procedures for Waste Programs Quality Documents, or ERM procedure 2-11000-ER-ADM-06.01, Document Control. These document control procedures provide measures that ensure controlled documents are reviewed for adequacy, approved for release by authorized personnel, and that the most current version of the document is distributed and used at the location where the activity is performed. The procedures also include measures to ensure that changes to controlled documents are reviewed, approved, and issued in the same manner as the original document.

The responsibilities and methods that formally control the release, storage, and distribution of Engineering designated Controlled Documents are established in COEM 6.1.4 and 6.6. Each Engineering controlled document is maintained to reflect its current status. SEP evaporator system documents to be controlled by Engineering include, as a minimum, design documents (e.g., drawings, specifications, and computer codes), inspection and test procedures, and design change requests.

6.7 Control of Purchased Items and Services

EG&G Rocky Flats procedure 1-50000-04.01, *Procurement Document Control* establishes the responsibilities and methods for procurement planning (1-50000-04.01 is supplemented by 3-21000-ADM-04.01 for procurement initiated by the ERM organization). 1-50000-04.01 includes measures for evaluating and selecting procurement sources, evaluating supplier performance, conducting receipt and verification inspections, and documenting nonconformances. All SEP IM/IRA project materials, parts, equipment, instrumentation, and services shall be purchased and received in accordance with measures established by 1-50000-ADM-04.01 and the COEM.

Controls for the purchase of materials, equipment, and services initiated by Engineering as part of the design and construction of the SEP evaporator system and associated tanks, piping, and instrumentation are established in the COEM. COEM provides methods and criteria for determining safety classifications, preparing procurement specifications, and establishing commercial grade dedication requirements. COEM 6.5.14 provides guidance for preparing procurement specifications that include the identification and traceability of material and parts.

6.8 Identification and Control of Items, Samples, and Data

Items, parts, components, and materials used in the construction, installation, and operation of the SEP evaporator system shall be identified as required by the COEM. This includes physical identification of items by etched markings, strip markings, heat number, part number, or other appropriate means, either on the item or on records directly traceable to the item. The identification of the item will be

maintained throughout fabrication, installation, and use of the item. Materials, parts, and components shall be identified and controlled to prevent inadvertent use of defective items or incorrect use. Identification and control of items are implemented through the COEM during the design process and by the IWCP during construction and installation.

All pretreatment and treatment samples shall be identified and controlled. The requirements for sample volumes, types of containers, and preservatives for samples collected during the acceptance phase are specified in the Building 910 Product Qualification Test Plan. Acceptance phase samples will be identified, stored, and shipped as described in ERM operating procedure 5-21000-OPS-FO.13, Containerizing, Preserving and Storage of Soil and Water Samples. Samples collected during the production phase shall adhere to the requirements for volumes, container types, preservatives, identification, and handling specified in the Building 910 Product Water Sampling Plan.

A sample chain-of-custody (COC) will be initiated, in accordance with 5-21000-OPS-FO.13, at the time acceptance phase samples are collected and will be maintained through all transfers of custody until the sample is received at the off-site analytical laboratory. Samples shall be logged in upon receipt at the analytical laboratory and sample tracking throughout the analytical process shall be maintained in accordance with laboratory procedures, which must be submitted to and concurred with by the ERM Sample Management Division Manager, or designee. Sample chain-of-custody for production phase samples shall be initiated and maintained from sample collection through sample analysis (including sample tracking within the laboratory) in accordance with RFP 881 Laboratory chain-of-custody and sample tracking procedures.

All field measurements and observations shall be recorded in SEP IM/IRA project-specific logbooks or field data sheets. Measurements and observations that will be considered QA records include field measurements of pH, temperature, conductivity, flow rate, date and time of sample collection, etc. Acceptance phase field records shall be submitted to the SEP Project Manager and the ERM Records Center in accordance with 5-21000-OPS-FO.02, Submittal of Field QA Records. Production phase records shall be handled and maintained in accordance with the RFP Records Management Manual and

RFP procedure 1-48000-QAR-001, Quality Assurance Records. Laboratory data shall be compiled into data packages and controlled as described previously in Section 6.3.2.7.

6.9 Control of Processes

The operation of the Building 910 evaporator system is a process that requires control. The process is described in Section 3 of the SEP IM/IRA Decision Document. SEP evaporator system operating procedures will be prepared to control the overall process. Operating procedures to be developed include the following:

1. 4-22PEP-910-001, Portable Waste Treatment Evaporators Line-up Check-off List
2. 4-22PEP-910-002, EDTA Addition
3. 4-22PEP-910-003, Nitric Acid Addition
4. 4-22PEP-910-004, Evaporator Reed System
5. 4-22PEP-910-005, Unit 1, 2 and 3 Evaporators
6. 4-22PEP-910-008, Distillate System
7. 4-22PEP-910-009, Concentrate System
8. 4-22ARP-101-MEMS, Building 910 Unit Evaporators MEMS Alarm Response Procedures
9. 4-22ARP-101-VC, Building 910 Unit Evaporators VC Alarm Response Procedures
10. 4-22ARP-101-MCP, Building 910 Main Control Panel Alarm Response Procedures
11. 4-22ARP-101-ANN, Building 910 Annunciator Panel Alarm Response Procedures
12. 4-22ARP-101-AA910, Building 910 Alarm Annunciator Panel Alarm Response Procedures
13. 4-30000-FO-0001, Decontamination
14. 4-22ARP-101-CIA-1108, Ponds Leak Detector Alarm Response Procedure
15. 4-22ARP-101-CIA-1116, Sump Leak Detector Alarm Response Procedure
16. 4-22ARP-XXX-ANN1, Pump House 308B Trouble Alarm Response Procedure

The process performance requirements of the evaporator system are specified in Section 3 of the IM/IRA Decision Document. Action levels for the various components of the process are specified in

the WAP (Appendix B of the IM/IRA Decision Document), and will be determined from analytical results of samples and automatic, in-line analyzers. The sampling and analytical processes for the acceptance and operation phase were discussed previously in Section 6.3.2.

Process operations shall be performed by qualified personnel. Operations personnel shall be trained, as necessary, and qualified as specified in Section 6.2. Special processes, as defined by the design process under the COEM, shall be implemented through the IWCP Work Package. COEM 6.3 describes the methodology for specifying the functional and technical requirements of an engineering project, including any special processes.

6.10 Inspection

COEM 6.1.1, which contains the requirements and responsibilities required to document the design process, includes instructions for defining the applicable inspection requirements of a project. Those materials, parts, and components of the evaporator system that require inspection shall be identified during the design process as described in COEM 6.1.1. If mandatory inspection hold points are identified, work will not proceed without the approval of the designated inspection representative. Inspections of materials, parts, and components shall be conducted by the EG&G Rocky Flats Facilities Inspection group, in accordance with SAA procedures for conducting inspections. Inspections will be documented on inspection checklists, which are considered ERM QA records, that must be submitted to the ERM Records Center. Any nonconformances identified during inspections shall be documented with Nonconformance Reports, which are addressed further in Section 6.15.

Inspections will be conducted of the pond fluid and condensate storage and evaporator treatment operation in accordance with instructions for inspections of container storage and treatment units specified in the EG&G Rocky Flats Hazardous Waste Manual (1-10000-HWR) Section 10.0. Section 10.0 of 1-10000-HWR is based on plant policies and CDH interim status regulations of 6 CCR 1007-3 Part 265. The inspection will be performed by E&WM personnel.

Inspections of the sample collection process will be conducted under the direction of the ERM QAPM. These inspections will be conducted and documented in accordance with ERM procedure 3-21000-ADM-10.01, Inspections.

6.11 Test Control

The overall operation of the system will be tested during the acceptance phase of the project. The operation of the system will be evaluated based on the analytical results of the samples taken during the acceptance phase. The action levels for the acceptance phase are established in the WAP (Appendix B of the SEP IM/IRA Decision Document).

In addition to the acceptance phase testing, it will be necessary to conduct a cold systems operation test to validate the RFP engineering analysis, after the system setup is performed by the system's supplier (a hot system operation test is not required, since the components will be tested during the cold SO testing). RFP test procedures will be developed and executed for the system equipment. The system operation testing will be conducted to ensure interlock operability and operation boundaries.

In addition to the system operation tests, all new and existing piping that will be used to convey feed, distillate, condensate, and product water will be hydrostatically tested. All test results will be documented. Test results are considered ERM QA records which must be transferred to the ERM Records Center.

6.12 Control of Measuring and Test Equipment

Measuring and test equipment (M&TE) used in the construction/installation, inspection, and testing or the SEP evaporator system shall be selected, identified, calibrated, and maintained in accordance with the methods established in RFP administrative procedure 1-50000-ADM-12.01, Control of Measuring and Test Equipment.

Instrumentation used to monitor and control the evaporator system, including the in-line conductivity analyzer, the solenoid operated valve actuated by the conductivity analyzer, and the flow meter, shall be calibrated through the RFP Metrology Laboratory. The Building 910 instrumentation requiring calibration have been compiled onto a Metrology Lab Calibration List, which identifies calibration requirements and frequencies. Stickers will be placed on the instrumentation that identifies daily or periodic user calibration requirements.

Preventive and corrective maintenance to the system and the M&TE will be performed through implementation of the IWCP Work Packages.

6.13 Handling, Storage, and Shipping

Controls for the packaging, handling, storage, shipping, cleaning, and preservation of items which have the potential of impacting safety and the operability of the evaporator system are established in Section 13.0 of the QAPjP. The requirements of Section 13 of the QAPjP do not apply to samples collected for analysis, since handling, storage, shipping, and custody of samples was addressed in Section 6.8. In addition to the requirements of the QAPjP, measures to ensure that cleaning, handling, storage, and shipping are accomplished in accordance with design specifications to preclude damage or deterioration by environmental conditions. Storage requirements are specified by RFP Standards and are recorded on procurement document packages.

6.14 Identification, Inspection, Test, and Operations

Tags or other means of identification shall be used to identify the status of parts, materials, and components that require inspection or tests. The removal of status indicators shall be controlled by the inspecting or testing organization.

6.15 Control of Nonconformances

Items, samples, and data that do not conform to specifications and/or requirements shall be identified, segregated (where necessary to prevent inadvertent use), dispositioned, and evaluated in accordance with approved procedures. Nonconformances related to the design, construction/installation, or testing of the SEP IM/IRA evaporator system, and any waste related nonconformance, shall be controlled in accordance with RFP procedure 1-50000-ADM-15.01, Control of Nonconformances. Operational nonconformances, with the exception of those related to waste handling and management, shall be controlled in accordance with ERM procedure 2-11000-ER-ADM-15.01, Control of Nonconforming Items, Samples, and Data. All Nonconformance Reports initiated in response to SEP IM/IRA-related activities are considered ERM QA records and must be submitted to ERM Central Records.

6.16 Corrective Action

The identification, reporting, closeout, and documentation of significant conditions adverse to quality shall be accomplished in accordance with RFP procedures 1-50000-16.16, Corrective Action Program. All Corrective Action Reports generated in response to adverse conditions relating to the SEP IM/IRA project are considered ERM QA records and must be submitted to the ERM Records Center.

6.17 Quality Assurance Records

SEP IM/IRA records that are considered ERM QA records include, but are not necessarily limited to, the SEP IM/IRA Decision Document (including all appendices), design documents, procurement documents, construction/installation records, supplier/subcontractor evaluations, inspection records, test records, logbooks, sampling records, sample chain-of-custody records, analytical data packages, interim and annual operating reports, action plans, operation manuals, NCRs, CARs, audit reports, surveillance reports, self-assessment reports, personnel training and qualification records, the QAPjP, any administrative and operating procedures referenced herein, and any other SEP IM/IRA-related plans, reports, or correspondence that may be used to support the OU4 Record of Decision. All ERM QA records generated during the planning, design, construction/installation, testing, and operation of the SEP IM/IRA evaporator system will be submitted to the ERM Records Center for processing according to ERM procedure 3-21000-ADM-17.01, Records Management.

All ERM QA records processed by the ERM Records Center will be reviewed in accordance with ERM procedure 2-11000-ER-ADM-17.02, Administrative Record, to determine if the record is part of the RFP Administrative Record.

6.18 Quality Verification

The quality verification requirements of Section 18.0 of the QAPjP are applicable the SEP IM/IRA. The requirements for system and performance audits, as defined by the EPA, shall be met through a combination of the independent QA audits, inspections, operation tests, and internal ERM surveillance and self-assessments.

Independent audits of the SEP IM/IRA project shall be conducted by the SAA organization in accordance with SAA procedures. ERM will conduct internal surveillance and self-assessments of the IM/IRA project to assure that the requirements of the SEP IM/IRA Decision Document, this QAA, and the QAPjP are being met.. ERM surveillance shall be conducted in accordance with ERM procedure

3-21000-ADM-18.02. Self-assessments conducted under the direction of the Solar Evaporation Ponds Project Manager shall be conducted in accordance with ERM procedure 2-11000-ER-ADM-18.05, Self-Assessment.

6.19 Software Quality Assurance

The use of computer software during the conduct of this activity is not anticipated. Therefore, the requirements of Section 19 of the QAPjP are not applicable.

6.20 Quality Improvement

Quality improvement associated with the SEP IM/IRA shall be implemented by establishing and adhering to plans and procedures that include quantitative and qualitative specifications and requirements for design, installation, and operation of the SEP IM/IRA evaporator system. Measures are in place to detect, identify, and report any items and processes that do not meet established specification and requirements. Deficiencies in quality of items or processes shall be dispositioned and corrected in accordance with established procedures, which have been referenced in this QAA.